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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/736,991	12/17/2003	Arthur H. Laflamme JR.	071469-0306511 (PC6025A)	6448
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<div>7590      02/05/2008</div>				
<div>EXAMINER MOORE, KARLA A</div>				
<div>ART UNIT      PAPER NUMBER</div>				
<div>1792</div>				
<div>MAIL DATE      DELIVERY MODE</div>				
<div>02/05/2008      PAPER</div>				

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No. 10/736,991	Applicant(s) LAFLAMME ET AL.	
	Examiner KARLA MOORE	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 November 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-34,36-41,43 and 44 is/are pending in the application.
- 4a) Of the above claim(s) See Continuation Sheet is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3,7,9,13,17,19,20,22,27,28,30,31,36-38 and 43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

Continuation of Disposition of Claims: Claims withdrawn from consideration are 4-6,8,10-12,14-16,18,21,23-26,29,32-34,39-41 and 44.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
3. Claim 2 recites the limitation "the thermal insulation assembly". There is insufficient antecedent basis for this limitation in the claim. Examiner has assumed that the recitation is in reference to the first thermal insulation assembly.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-2, 7, 9, 17, 19-20, 22 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okase (US 6,228,173) in view of Otsuki (2001/0003271 A1) and Carpenter (2003/0159780 A1).

6. With respect to Claim 1, Okase discloses a reduced maintenance processing system (Figure 1, 1) for treating a substrate substantially as claimed and comprising: a chemical treatment system/chamber (Fig. 1, 4 and 6; shown in more detail in Figure 14) for chemically altering exposed surface layers on the substrate comprising a temperature controlled chemical treatment chamber (chamber 132 is heated using heating room 162); and a thermal treatment system (Fig. 1, 8 and 10; shown in more detail in Figure 2) for thermally treating the chemically altered surface layers on the substrate, the thermal treatment system comprising a temperature controlled thermal treatment chamber (chamber 24 is heated using radiating mechanism 90).

7. However, Okase fails to disclose either or both of the chemical treatment system/chamber or the thermal treatment system/chamber comprising a protective barrier layer formed on at least a portion of an inner surface thereof.

8. Otsuki teaches providing a film of  $\text{Al}_2\text{O}_3$  and  $\text{Y}_2\text{O}_3$  on an inner wall surface of a chamber (for heating, plasma, process gas, or a combination of them) and on exposed surfaces of members within the chamber for the purpose of providing high corrosion resistance and insulating properties (abstract).

9. It would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to have provided a protective barrier layer of  $\text{Al}_2\text{O}_3$  and  $\text{Y}_2\text{O}_3$  on at least a portion of an inner surface of either or both of the chemical treatment system/chamber and the thermal treatment system/chamber in Okase in order to provide high corrosion resistance and insulating properties as taught by Otsuki.

10. Okase and Otsuki disclose the processing system substantially as claimed and as described above.

11. However, Okase and Otsuko fail to explicitly teach a first insulation assembly coupled between the thermal treatment system and the chemical treatment system, the first thermal insulation assembly defining a common opening configured for transferring the substrate between the chemical treatment chamber and the temperature controlled thermal treatment chamber and a second thermal insulation assembly coupled to the thermal treatment system, the second thermal insulation assembly having a transfer opening configured for transferring the substrate therethrough.

12. Carpenter teaches the use of temperature isolating structures (Figure 1, 15) comprising a thermally insulative mass of material received between a transfer chamber (12) and chambers (14) attached thereto in a cluster tool for the purpose of more effectively reducing heat transfer between the chambers than would otherwise occur in the absence of said mass of material (abstract). Note: If the temperature isolating structures were provided in the apparatus of Okase at locations around the transfer chamber, a common first thermal insulation assembly could be located at gate valves G1 and/or G2, as claimed, for example to introduce substrates into the cluster tool. Although, Carpenter does not explicitly teach that the temperature isolating structures can be received at locations where the substrate enters and exits the overall system, one of ordinary skill in the art exercising ordinary common sense, creativity and logic would readily envision such a scenario for the purpose providing further thermal control over an entire processing system. A second thermal insulation assembly could be

located at either of the gate valves G6 or G7 leading to the thermal treatment systems 8 and 10. Further, the courts have ruled that “the test of obviousness is not whether features of the secondary reference may be bodily incorporated into the primary reference’s structure, nor whether the claimed invention is expressly suggested in any one or all of the references, rather the test is what the combined teachings would have suggested to those of ordinary skill in the art.” *Ex parte Martin* 215 USPQ 543, 544 (PO Bd Pat App 1981).

13. It would have been obvious to one of ordinary skill in the time the Applicant’s invention was made to have provided a first insulation assembly coupled between the thermal treatment system and the chemical treatment system, the first thermal insulation assembly defining a common opening configured for transferring the substrate between the chemical treatment chamber and the temperature controlled thermal treatment chamber and a second thermal insulation assembly coupled to the thermal treatment system, the second thermal insulation assembly having a transfer opening configured for transferring the substrate therethrough in *Okase and Osuki* in order to more effectively reduce heat transfer between the chambers than would otherwise occur in the absence of said mass of material as taught by *Carpenter*.

14. With respect to claim 2, in line with the teachings of *Otsuki* as described above, it would have been obvious of ordinary skill in the art at the time the Applicant’s was made to have provided a protective coating on any part of the first and/or the second thermal insulation assemblies that may come in contact with processing conditions, either

purposefully or inadvertently. There is always a chance of inadvertent exposure in a cluster tool.

15. With respect to claims 7 and 17: described above is the teaching of the protective barrier on the interior surface of the chemical treatment chamber and the temperature controlled thermal treatment chamber comprises at least one of  $Y_2O_3$ ,  $Sc_2O_3$ ,  $Sc_2F_3$ ,  $YF_3$ ,  $La_2O_3$ ,  $CeO_2$ ,  $Eu_2O_3$ , and  $DyO_3$ .

16. With respect to claims 9 and 19, Okase teaches the chemical treatment system and the thermal treatment system each further comprise a temperature controlled substrate holder, (Fig. 2 Item 36) and (Fig 14, 142), respectively. The teachings of Otsuki, described above, provide a teaching of providing a protective barrier coating on an exposed portion thereof, as claimed.

17. With respect to Claims 20 and 22: as described above the protective barrier of Otsuki can be formed on any exposed surface that might need protection. This would include the surface of a gate valve assembly. Also as described above, per Otsuki, the protective barrier layer would comprise at least one of  $Y_2O_3$ ,  $Sc_2O_3$ ,  $Sc_2F_3$ ,  $YF_3$ ,  $La_2O_3$ ,  $CeO_2$ ,  $Eu_2O_3$ , and  $DyO_3$ .

18. With respect to Claim 27: Okase discloses a processing system, wherein the thermal treatment system further comprises a substrate lifter assembly coupled to the thermal treatment chamber for vertically translating the substrate between a transfer plane and the substrate holder (Fig. 2 Item 62).



19. Claims 3, 13, 31, 36- 38 and 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okase, Otsuki and Carpenter as applied to claims 1-2, 7, 9, 17, 19-20, 22 and 27 above, and further in view of Carducci (US 2003/0037880 A1).

20. Okase, Otsuki and Carpenter disclose a processing system substantially as claimed and as described above and including a temperature controlled substrate holder mounted within the chemical treatment chamber and the thermal treatment system, each having a protective layer formed on an exposed surface. See above. Also disclosed are a vacuum pumping system coupled to the chemical treatment chamber (column 13, row 65 through column 14, row 7) and a gas distribution plate (182) comprising a plurality of gas injection orifices (188). As the gas distribution plate is clearly exposed to processing conditions, it would have been obvious to form a protective barrier layer on its exposed surface, as well as the orifices therein, per the teachings of Otsuki.

21. However, Okase, Otsuki and Carpenter fail to explicitly disclose that the gas distribution plate is coupled to a temperature controlled gas distribution system for introducing a process gas into the chemical treatment chamber; and the processing system further comprises a control system coupled to the chemical treatment system and the thermal treatment system, and configured to control at least one of a chemical treatment chamber temperature, a chemical treatment gas distribution system temperature, a chemical treatment substrate holder temperature, a chemical treatment substrate temperature, a chemical treatment processing pressure, a chemical treatment gas flow rate, a thermal treatment chamber temperature, a thermal treatment substrate

holder temperature, a thermal treatment substrate temperature, a thermal treatment processing pressure, and a thermal treatment gas flow rate.

22. Carducci teaches a gas distribution plate is coupled to a temperature controlled gas distribution system (multiple part numbers, e.g. Figure 1, 102, 103, 105) for introducing a process gas into a chemical treatment chamber (100); and the processing system further comprises a control system (Figure 1, 140, paragraph 68) coupled to the chemical treatment system and the thermal treatment system, and configured to control at least one of a chemical treatment chamber temperature, a chemical treatment gas distribution system temperature, a chemical treatment substrate holder temperature, a chemical treatment substrate temperature, a chemical treatment processing pressure, a chemical treatment gas flow rate, a thermal treatment chamber temperature, a thermal treatment substrate holder temperature, a thermal treatment substrate temperature, a thermal treatment processing pressure, and a thermal treatment gas flow rate in order to facilitate control of the chamber (paragraph 73).

23. At the time of invention, it would have been obvious to a person of ordinary skill in the art to have provided the gas distribution plate coupled to a temperature controlled gas distribution system for introducing a process gas into the chemical treatment chamber; and the processing system further comprises a control system coupled to the chemical treatment system and the thermal treatment system, and configured to control at least one of a chemical treatment chamber temperature, a chemical treatment gas distribution system temperature, a chemical treatment substrate holder temperature, a chemical treatment substrate temperature, a chemical treatment processing pressure, a

chemical treatment gas flow rate, a thermal treatment chamber temperature, a thermal treatment substrate holder temperature, a thermal treatment substrate temperature, a thermal treatment processing pressure, and a thermal treatment gas flow rate in Okase, Otsuki and Carpenter in order to facilitate control of the chamber as taught by Carducci.

24. With respect to claims 31, 36 and 37, each of the recitations contained therein in the descriptions and teachings of the above identified prior art.

25. With respect to claims 38 and 43, in addition to the description and teaching of Okase, Otsuki and Carpenter provided above, Okase further teaches the temperature controlled thermal treatment chamber comprising a vacuum pumping system (column 5, rows 39-45); and a temperature controlled upper assembly (72).

26. Claims 28 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable Okase, Otsuki and Carpenter as applied to claims 1-2, 7, 9, 17, 19-20, 22 and 27 above, and further in view of Perlov (US 2002/0170672 A1).

27. Okase, Otsuki and Carpenter disclose a processing system substantially as claimed and as described above.

28. However, Okase, Otsuki and Carpenter do not expressly state the substrate lifter assembly comprises a blade having three or more tabs for receiving the substrate and having a protective barrier formed on at least a portion of an exposed surface, and a drive system for vertically translating the substrate between the substrate holder and a transfer plane.

29. Perlov teaches the substrate lifter assembly comprises a blade having three or more tabs (Fig. 1 Items 25a-c) for receiving the substrate and having a protective barrier formed on at least a portion of an exposed surface (Paragraph 27 Lines 1-4), and a drive system for vertically translating the substrate between the substrate holder and a transfer plane (Fig 2 Item 24).

30. At the time of invention, it would have been obvious to a person of ordinary skill in the art to form the apparatus disclosed in Okase, Otsuki and Carpenter including the substrate lifter assembly comprises a blade having three or more tabs for receiving the substrate and having a protective barrier formed on at least a portion of an exposed surface, and a drive system for vertically translating the substrate between the substrate holder and a transfer plane in view of the teaching of Perlov. The suggestion or motivation for doing so would have been to provide a lift that does not produce particles or scratch a substrate during contact (Paragraph 27 Lines 1-5).

31. With respect to claim 30, it is also noted that Perlov teaches a processing system, wherein a protective barrier is formed on exposed surfaces (Paragraph 27 Lines 1-5). It would have also been obvious to one of ordinary skill in the art to utilize the teachings of Otsuki, which state that it is beneficial to provide protective barrier layers comprising the claimed materials on exposed surfaces of parts, such as the blade.

***Response to Arguments***

32. Applicant's arguments with respect to claims 14 November 2007 have been considered but are moot in view of the new ground(s) of rejection. Based on the amendments to the claims, the previous rejections were changed significantly. Applicant's arguments are not addressed in detail herein because they are based on previously applied combinations which are no longer valid and/or relied upon, due to the claim amendments. Also, where appropriate, clarifications of the teachings of previously applied prior art that continues to be relied upon are provided, as well.

***Conclusion***

33. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to KARLA MOORE whose telephone number is (571)272-1440. The examiner can normally be reached on Monday-Friday, 9:00 am-6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Karla Moore/  
Primary Examiner, Art Unit 1792  
4 February 2008